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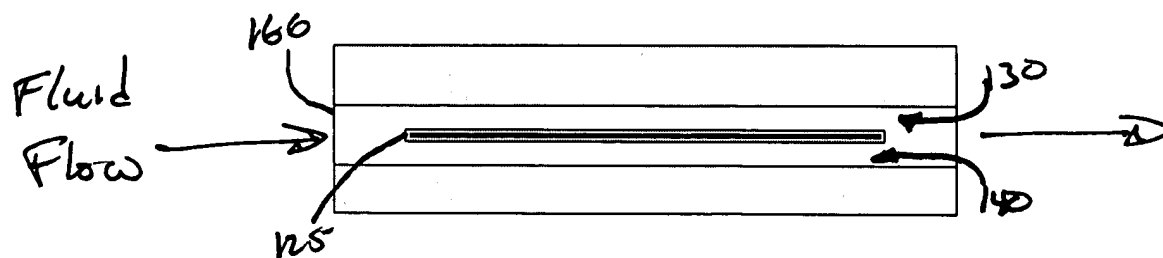
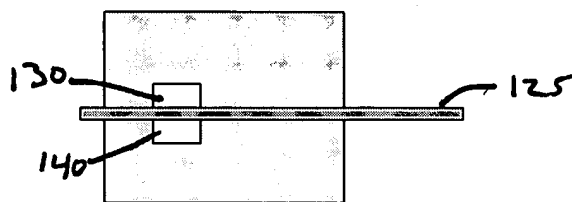
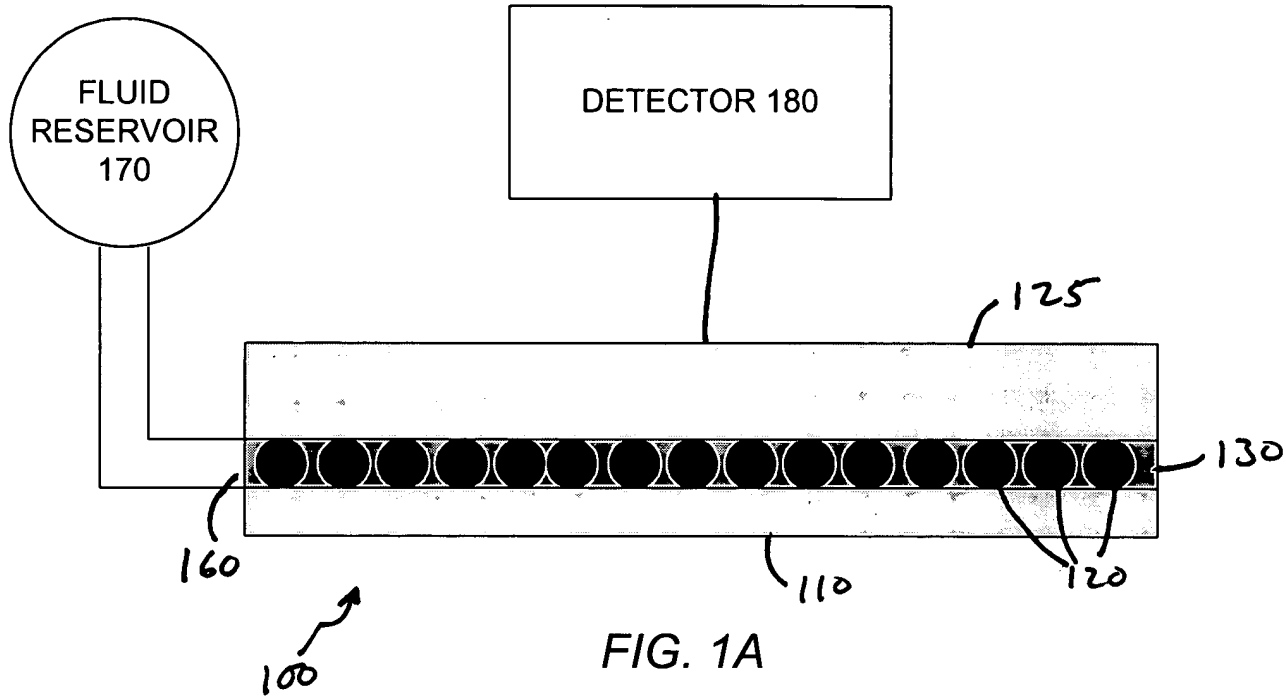
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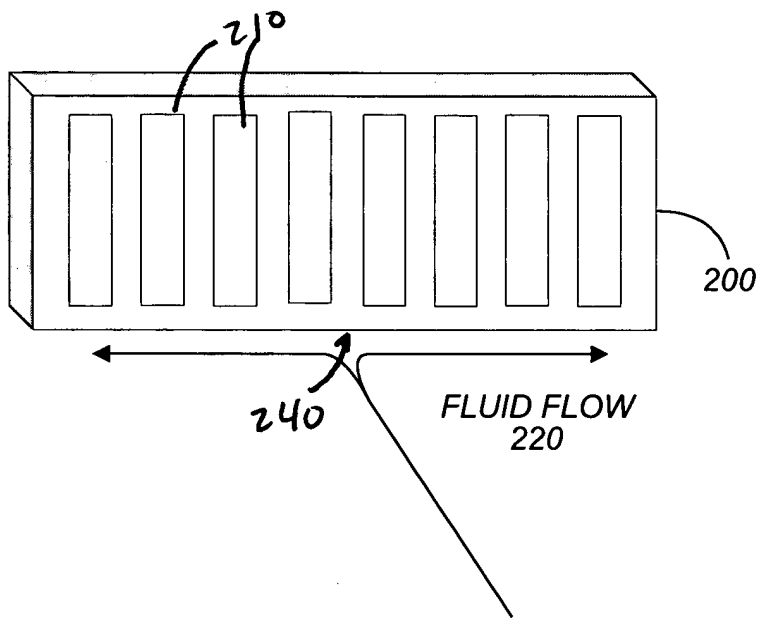


FIG. 2

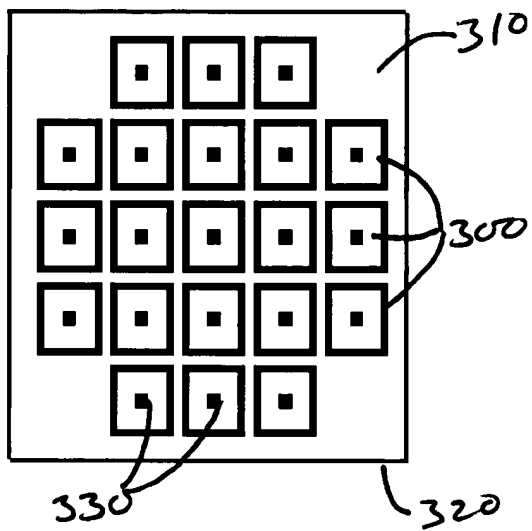


FIG. 3

Analyte Flow: Normal vs. Composite Sensors

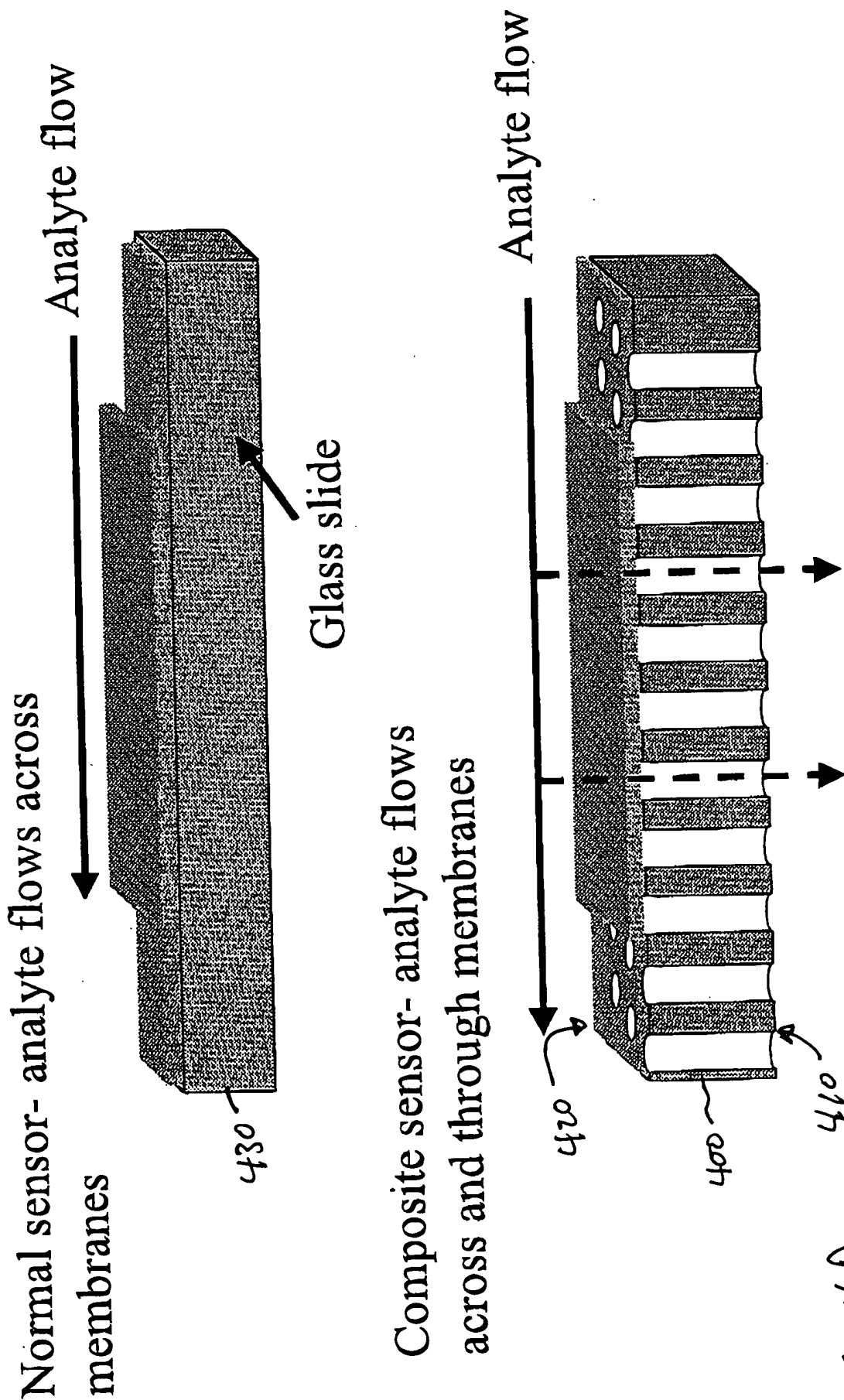
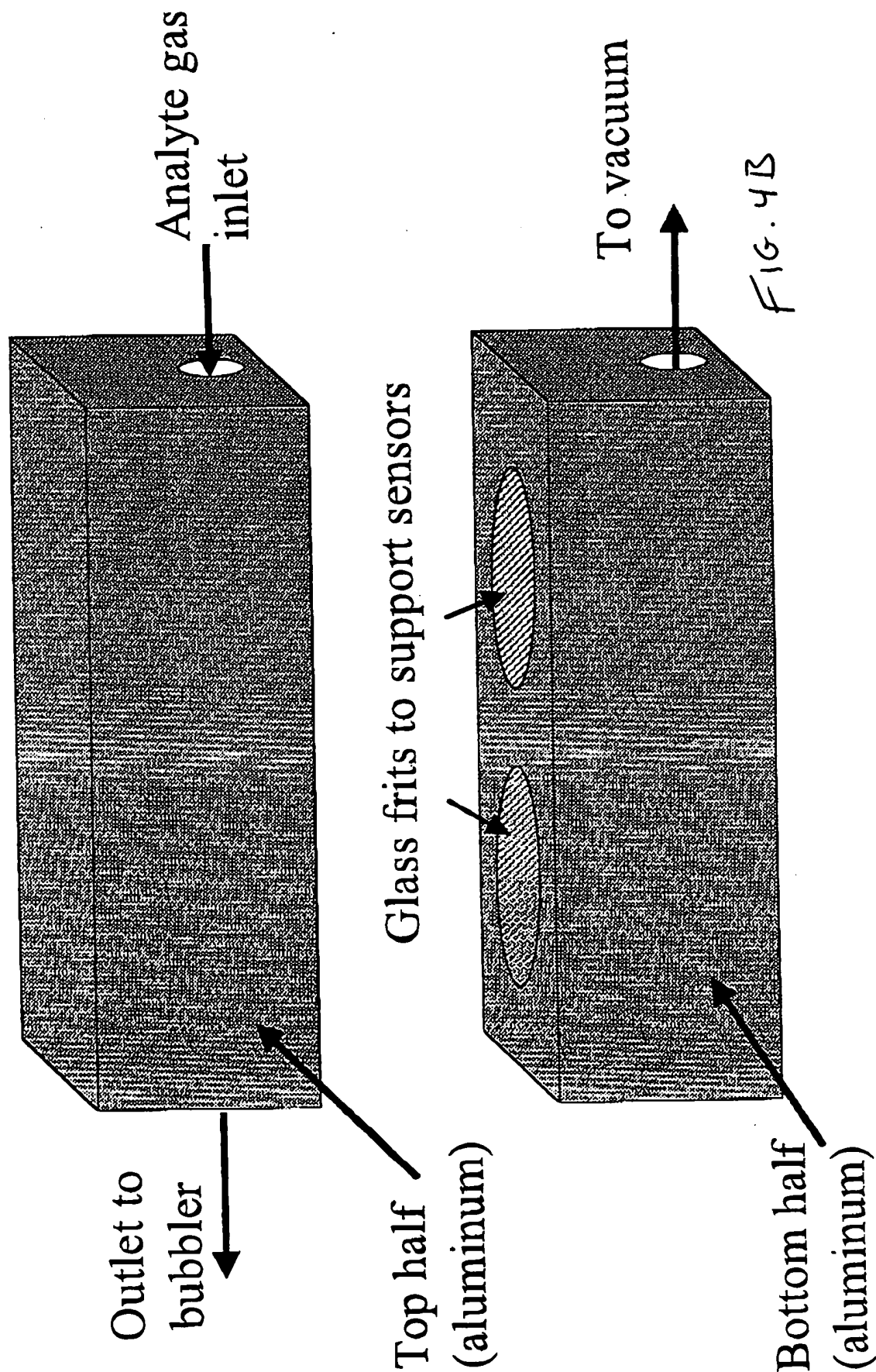


FIG. 4A

Schematic of Apparatus



a)

face-view of substrate

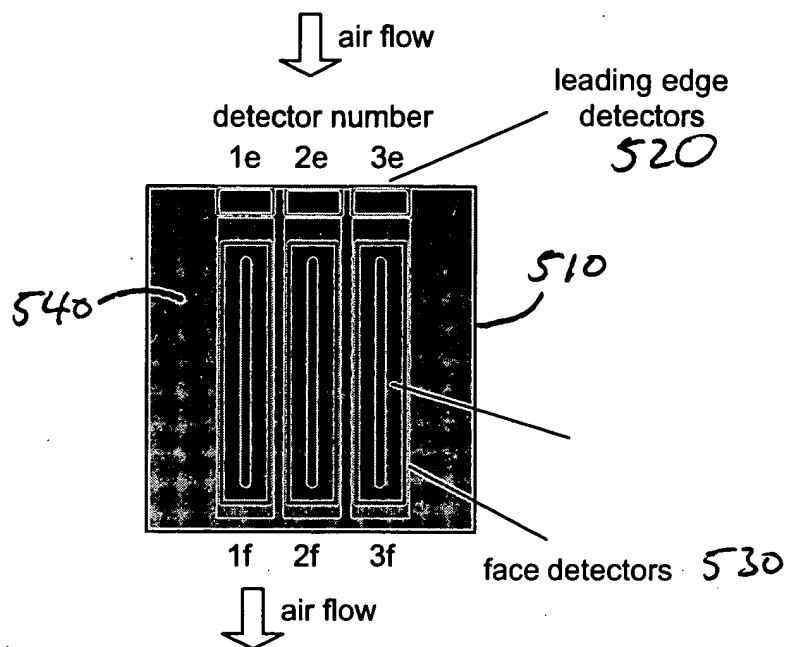


FIG. 5A

b)

leading edge-view of 2 substrates

510
substrates

air flows through the
channels (into page)

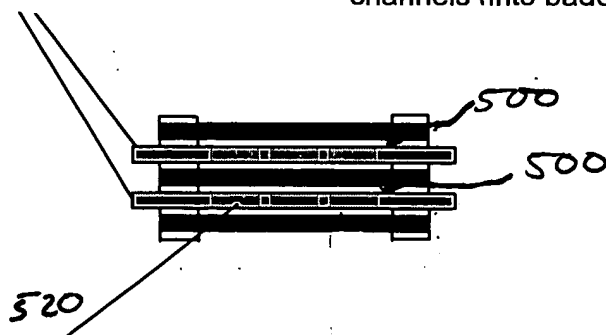


FIG. 5B

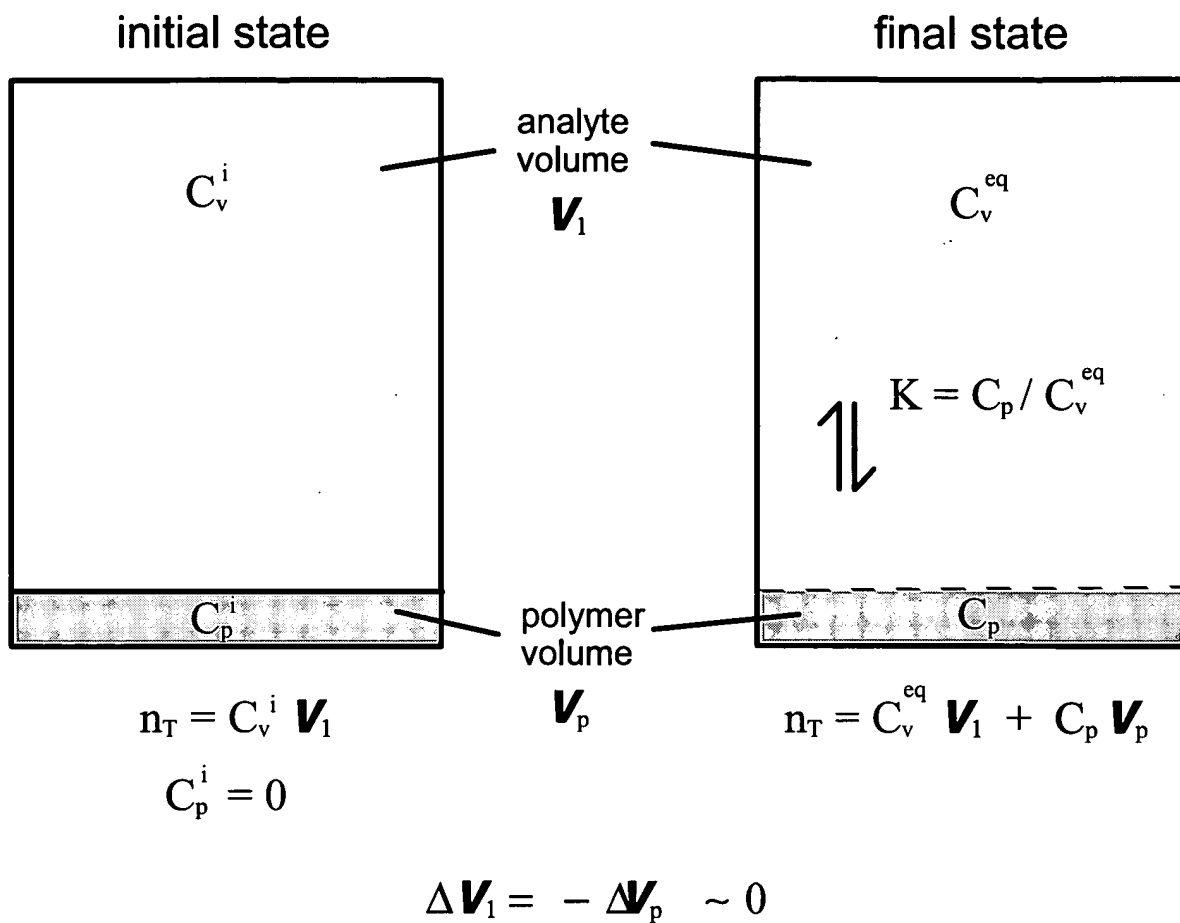


FIG. 6

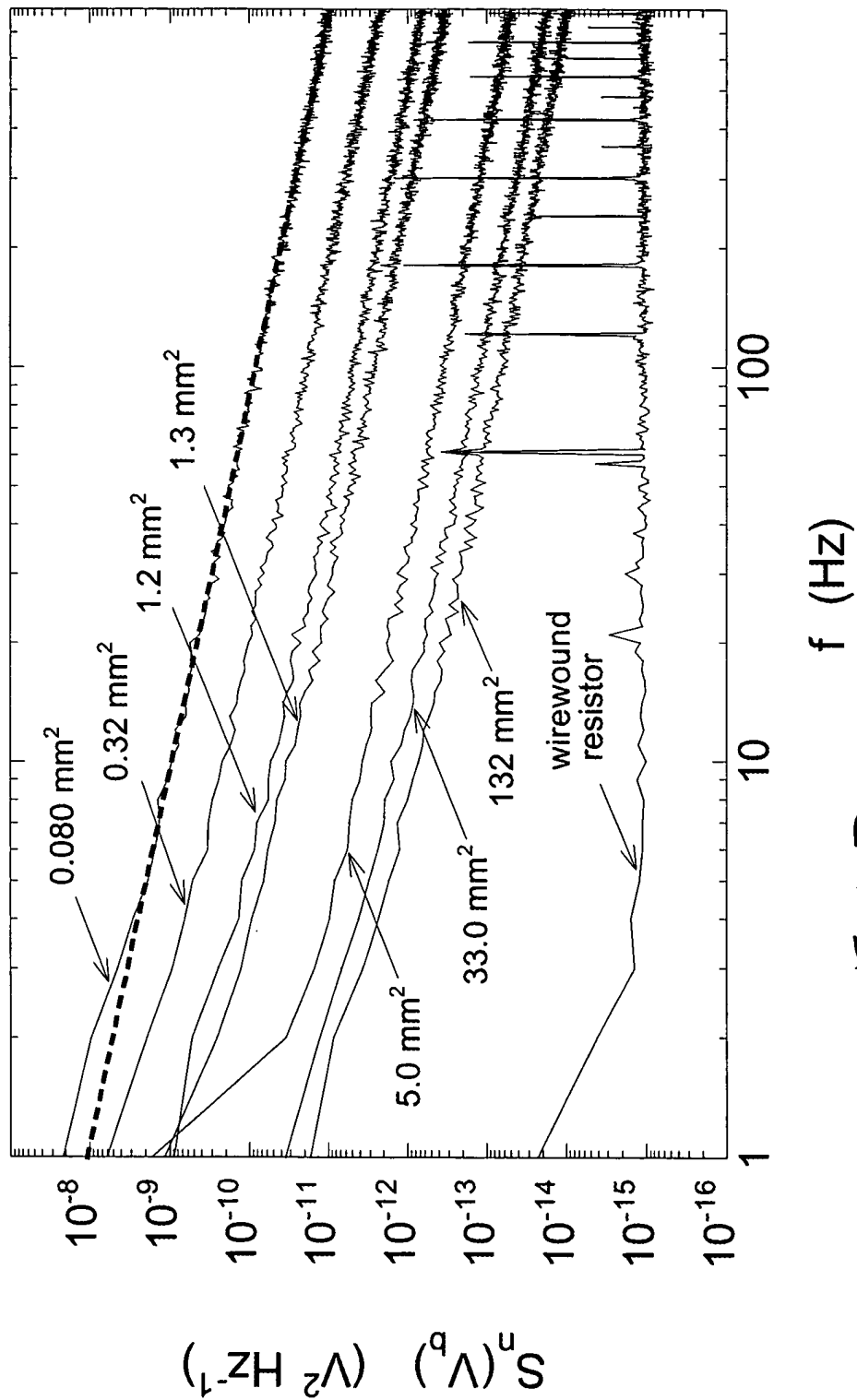


FIG. 7

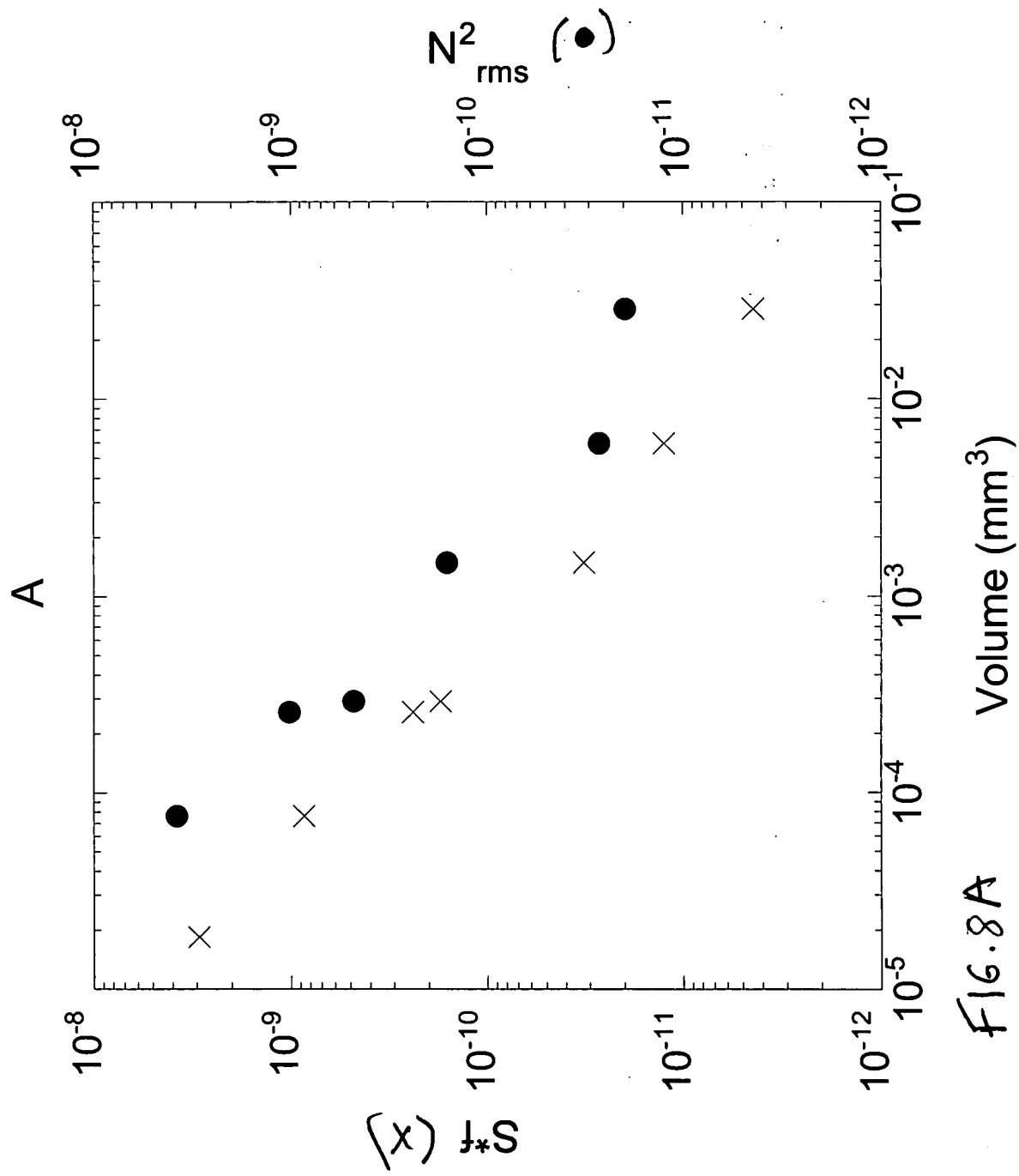


FIG. 8A

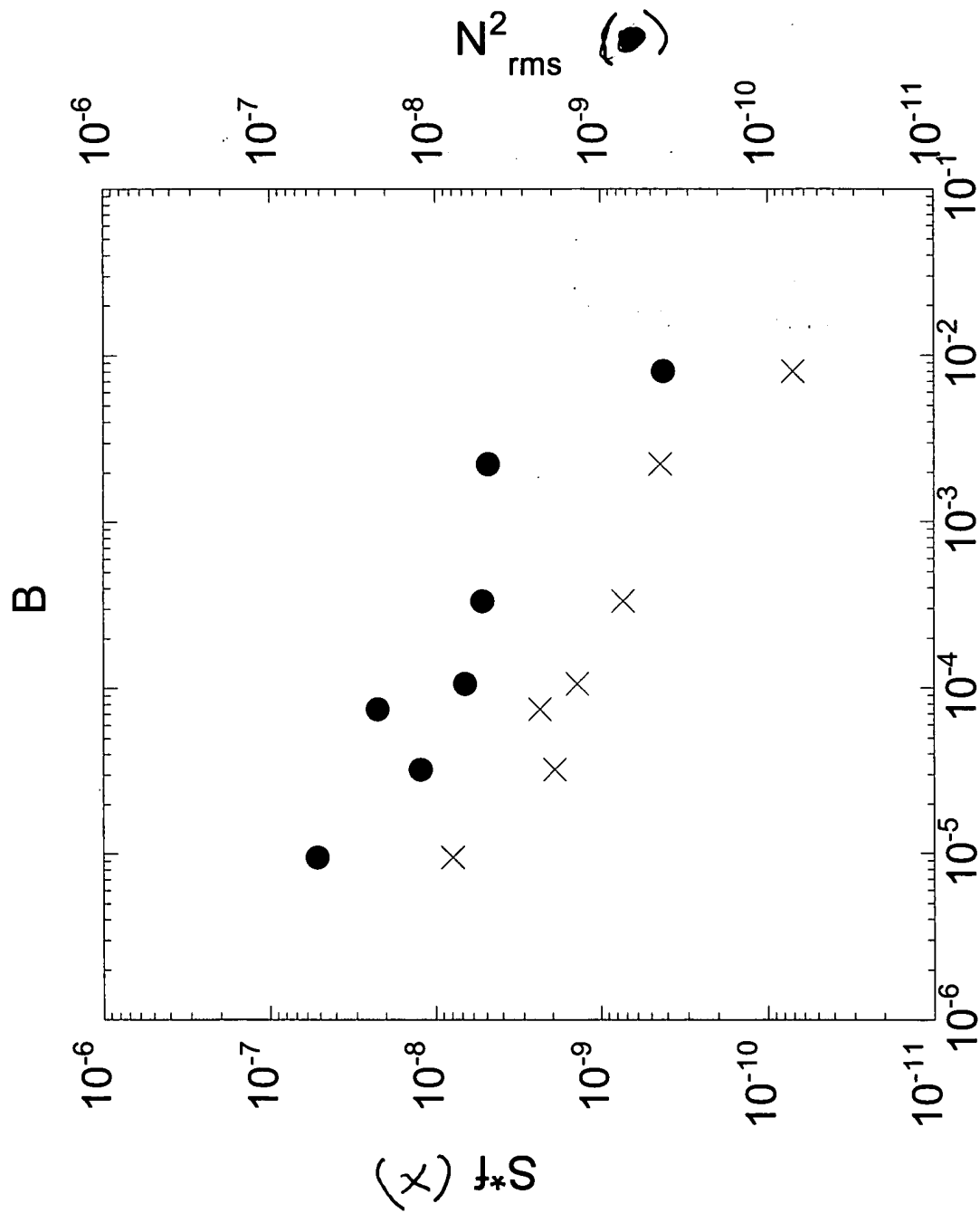


FIG. 8B Volume (mm³)

10240-102430

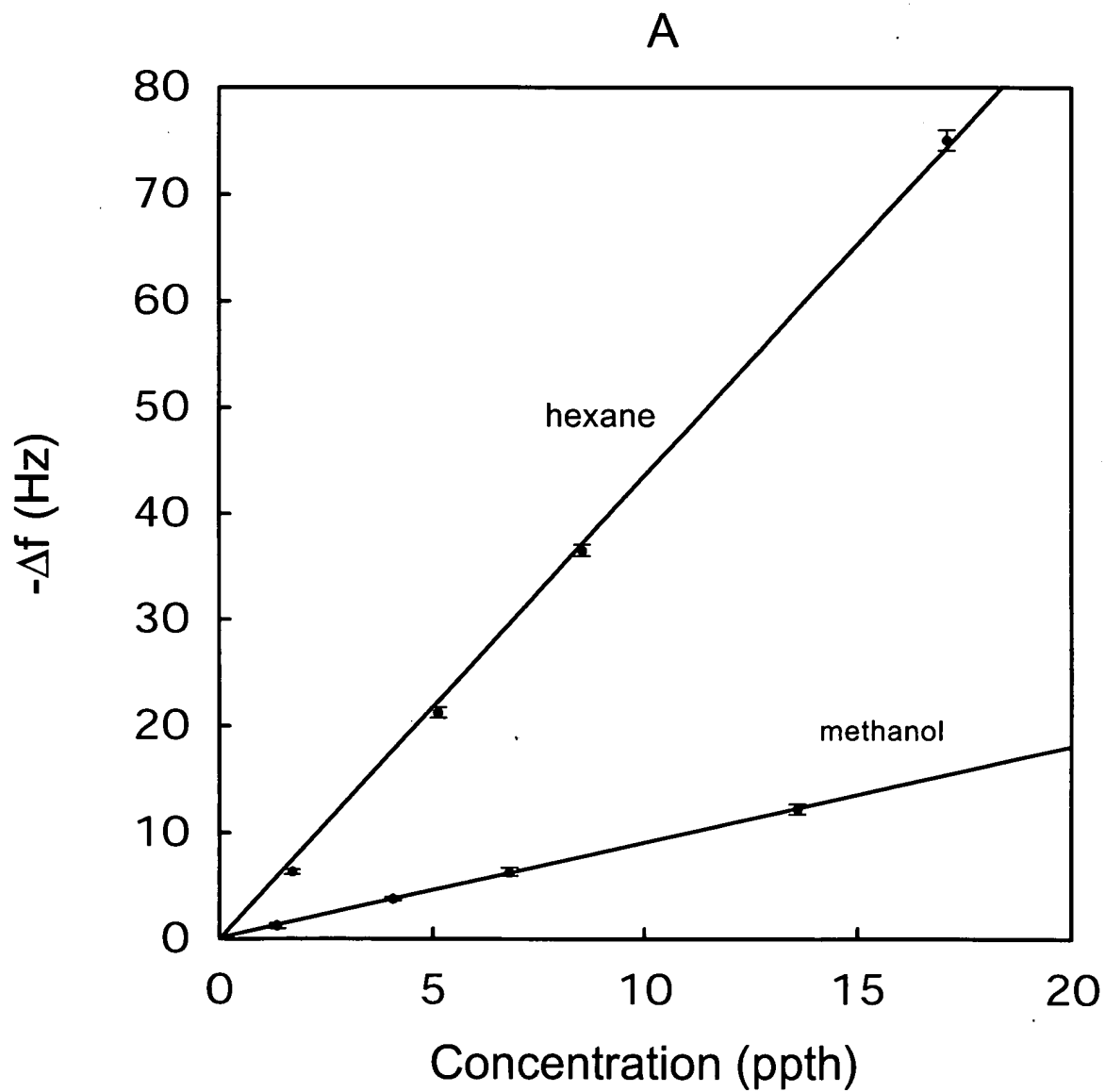


FIG. 9A

Responses, Noise, and S/N for two Types of Polymer-Carbon Black Composite Detectors in the Configuration of FIGS. 5A and 5B.^a

Analyte	Vapor Pressure of Pure Analyte	log Partition Coefficient (log k) ^b	Stack Assembly	$\Delta R/R_0 \times 100$				N_{rms}				S/N			
				PCL	PEVA	PCL	PEVA	PCL	PEVA	PCL	PEVA	PCL	PEVA	PCL	PEVA
	P^0 (Torr)	PPM ^c		edge ^d	face	edge	face	edge	face	edge	face	edge	face	edge	face
hexane	1.28×10^2	1.71×10^5	2.23	1.65	2.23	1.07 \pm 0.03	3.3 \pm 0.1	3.5 \pm 0.6	(1.5 \pm 0.7) $\times 10^{-3}$	(1.9 \pm 0.5) $\times 10^{-4}$	(5 \pm 1) $\times 10^{-4}$	(8 \pm 2) $\times 10^{-5}$	60 \pm 14	73 \pm 20	460 \pm 200
methanol	1.02×10^2	1.36×10^5	1.98	2.26	2.26	2.7 \pm 0.1	2.0 \pm 0.4	2.1 \pm 0.5	(1.4 \pm 0.8) $\times 10^{-3}$	(2.0 \pm 0.5) $\times 10^{-4}$	(5 \pm 1) $\times 10^{-4}$	(9 \pm 2) $\times 10^{-5}$	140 \pm 42	42 \pm 10	270 \pm 120
dodecane	9.71×10^{-2}	1.29×10^2	5.35 ^e	4.77 ^e	4.77 ^e	1.16 \pm 0.03	3.7 \pm 0.1	3.6 \pm 0.6	(1.3 \pm 0.6) $\times 10^{-3}$	(2.0 \pm 0.4) $\times 10^{-4}$	(5 \pm 1) $\times 10^{-4}$	(9 \pm 0.3) $\times 10^{-5}$	60 \pm 13	76 \pm 21	440 \pm 170
hexadecane	9.11×10^{-4}	1.21	6.70 ^e	7.35 ^e	7.35 ^e	0.01 \pm 0.09	0.26 \pm 0.09	0.01 \pm 0.01	(1.4 \pm 0.9) $\times 10^{-3}$	(1.9 \pm 0.3) $\times 10^{-4}$	(5 \pm 1) $\times 10^{-4}$	(8 \pm 3) $\times 10^{-5}$	1 \pm 1	6 \pm 2	2 \pm 2
mean						0.3	0.02	0.3	0.03	2 $\times 10^{-3}$	2.1 $\times 10^{-4}$	6 $\times 10^{-4}$	1.5 $\times 10^{-4}$	3	2

a) Data were averages of 10 randomized presentations of the 4 analytes each at $P/P^0 = 0.050$, across 3 copies of each of the 2 detector types, with each value representing 30 vapor/polymer interactions. The experiment was repeated for 3 independently prepared stack assemblies (A,B,C). The data represent responses after 200 s of exposure to analyte. b) Determined from quartz crystal microbalance measurements on unfilled polymers. c) Vapor pressure of analyte expressed in ppm of air at 294 K. d) Edge refers to the leading edge sensors and face refers to the face sensors depicted in FIGS. 5A and 5B. The uncertainties are expressed as 95% confidence intervals. e) Values were estimated based on measurements of K for hexane and correction for the differences in vapor pressure between hexane and the alkane of interest assuming constant activity coefficients for the sorption of the alkanes into a given polymeric phase.

Fig. 10

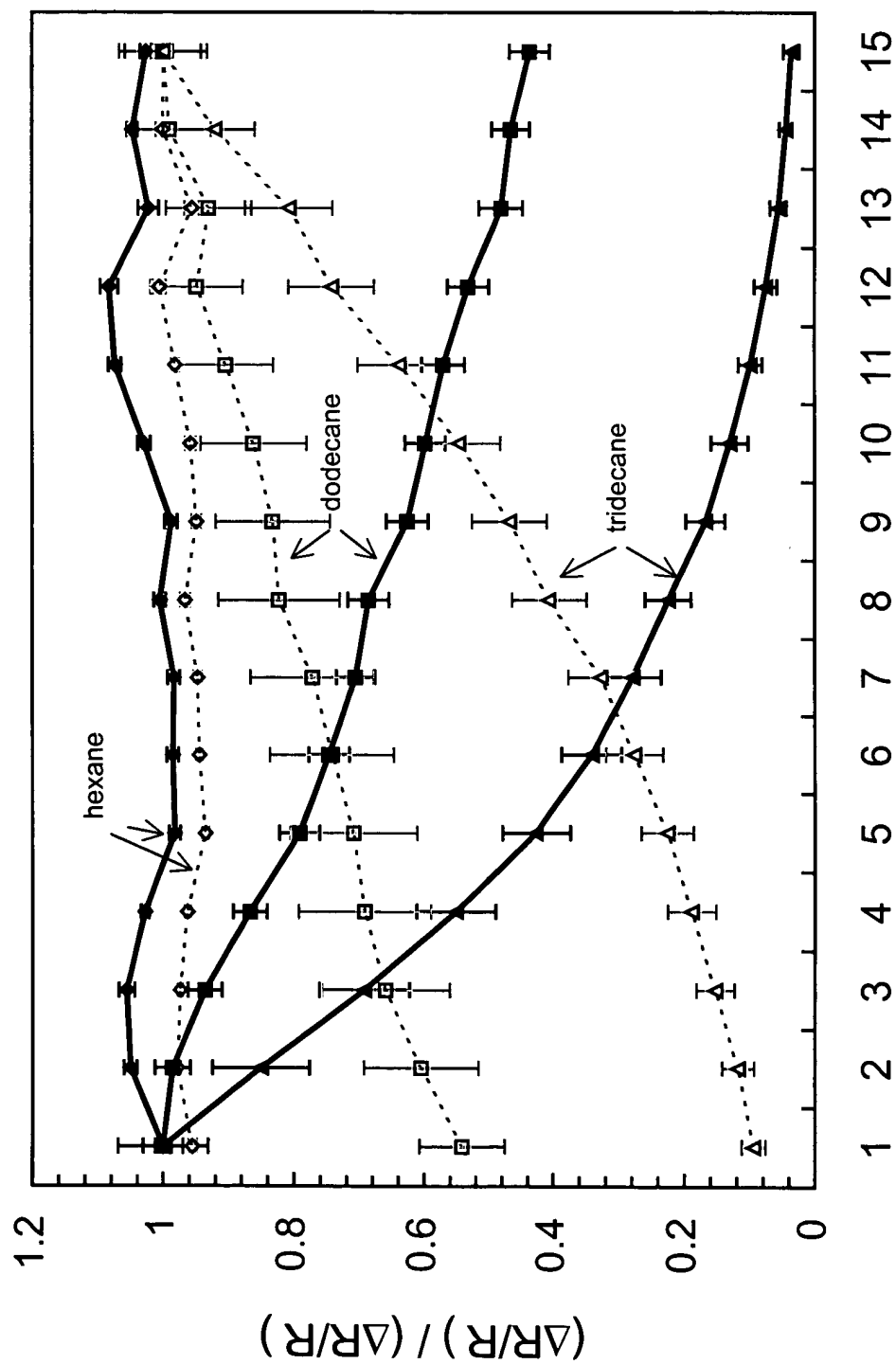


FIG. 11 Sensor Position

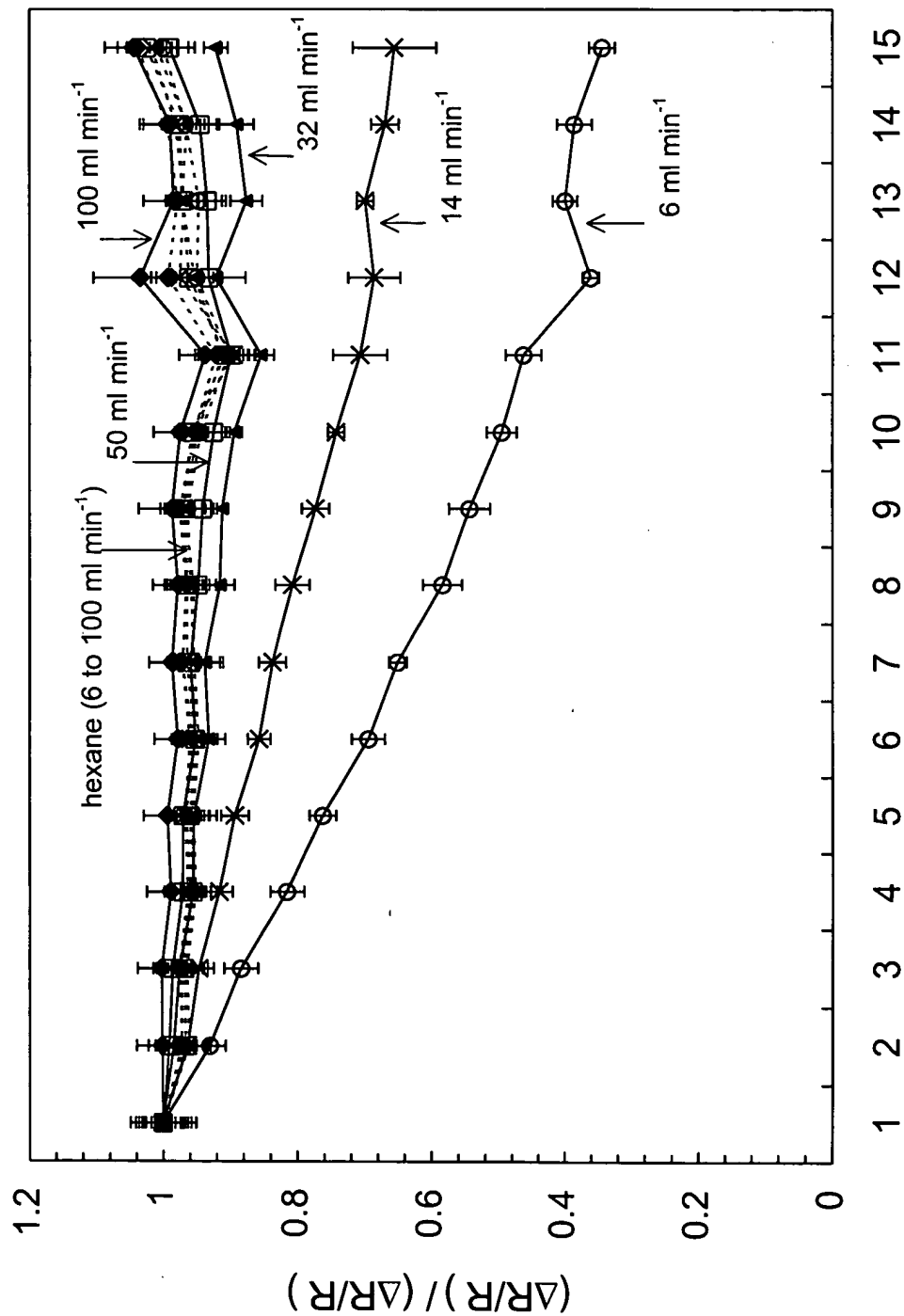


FIG. 12A

Fig. 123

TOLEDO 1024060

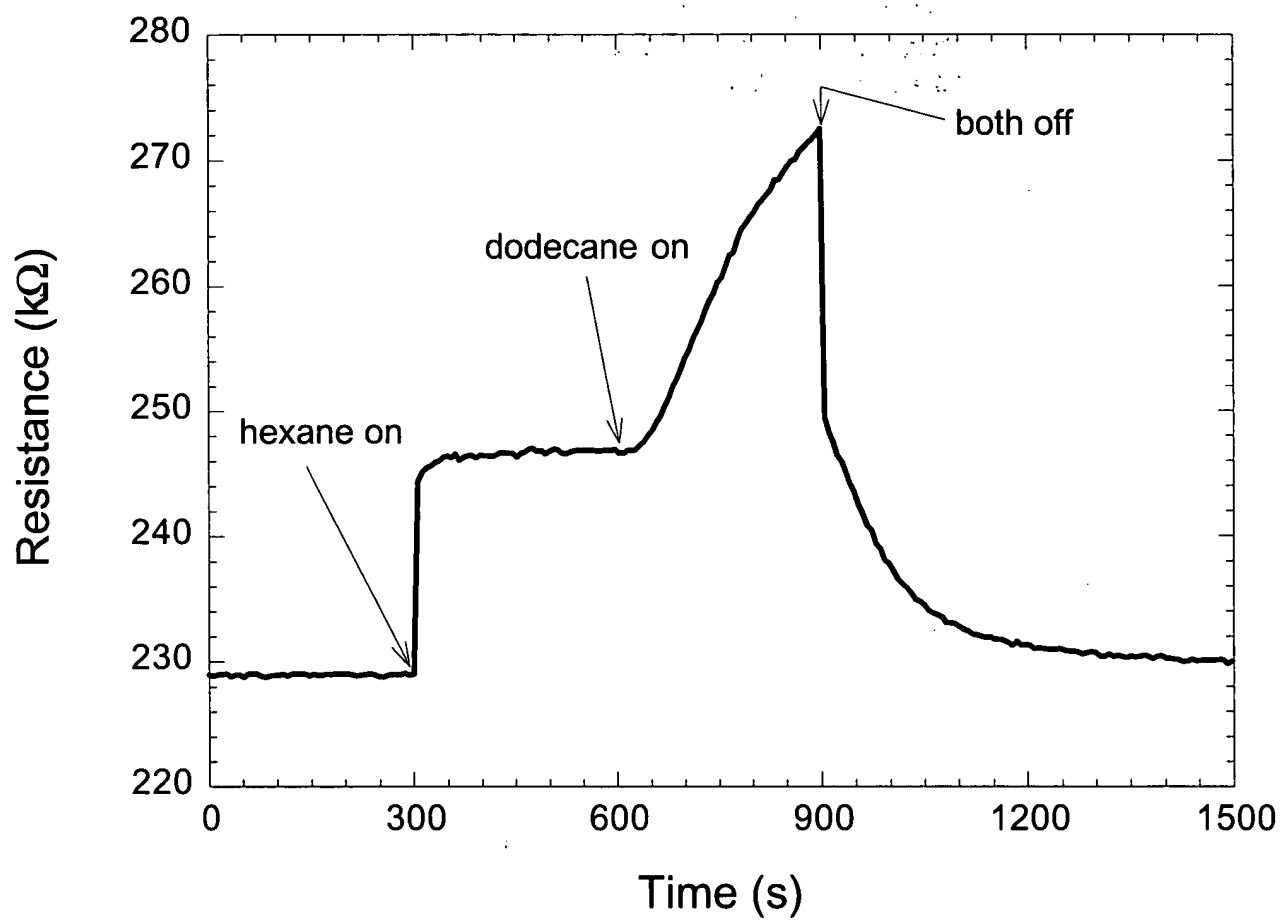


FIG. 13

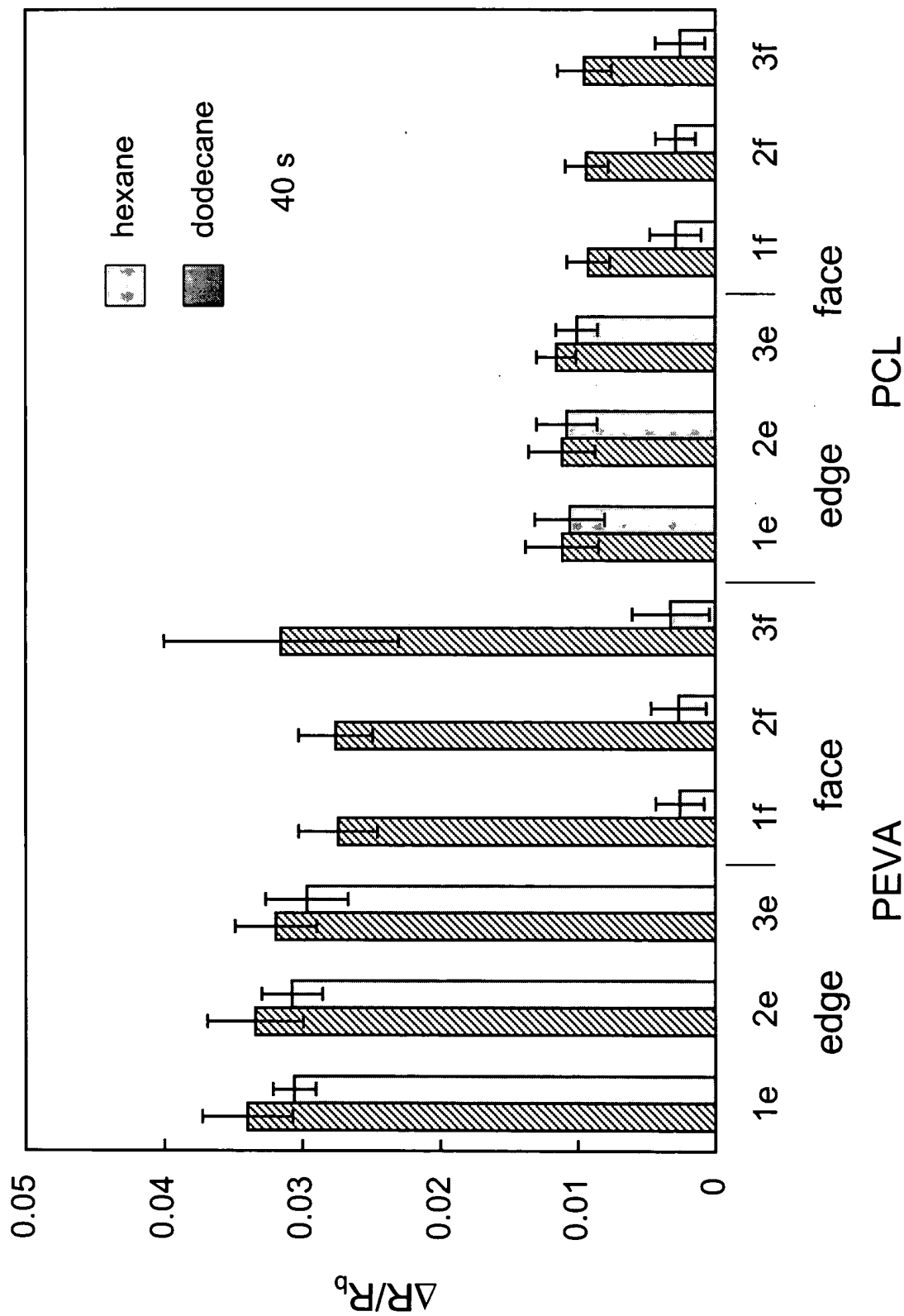


FIG. 14A

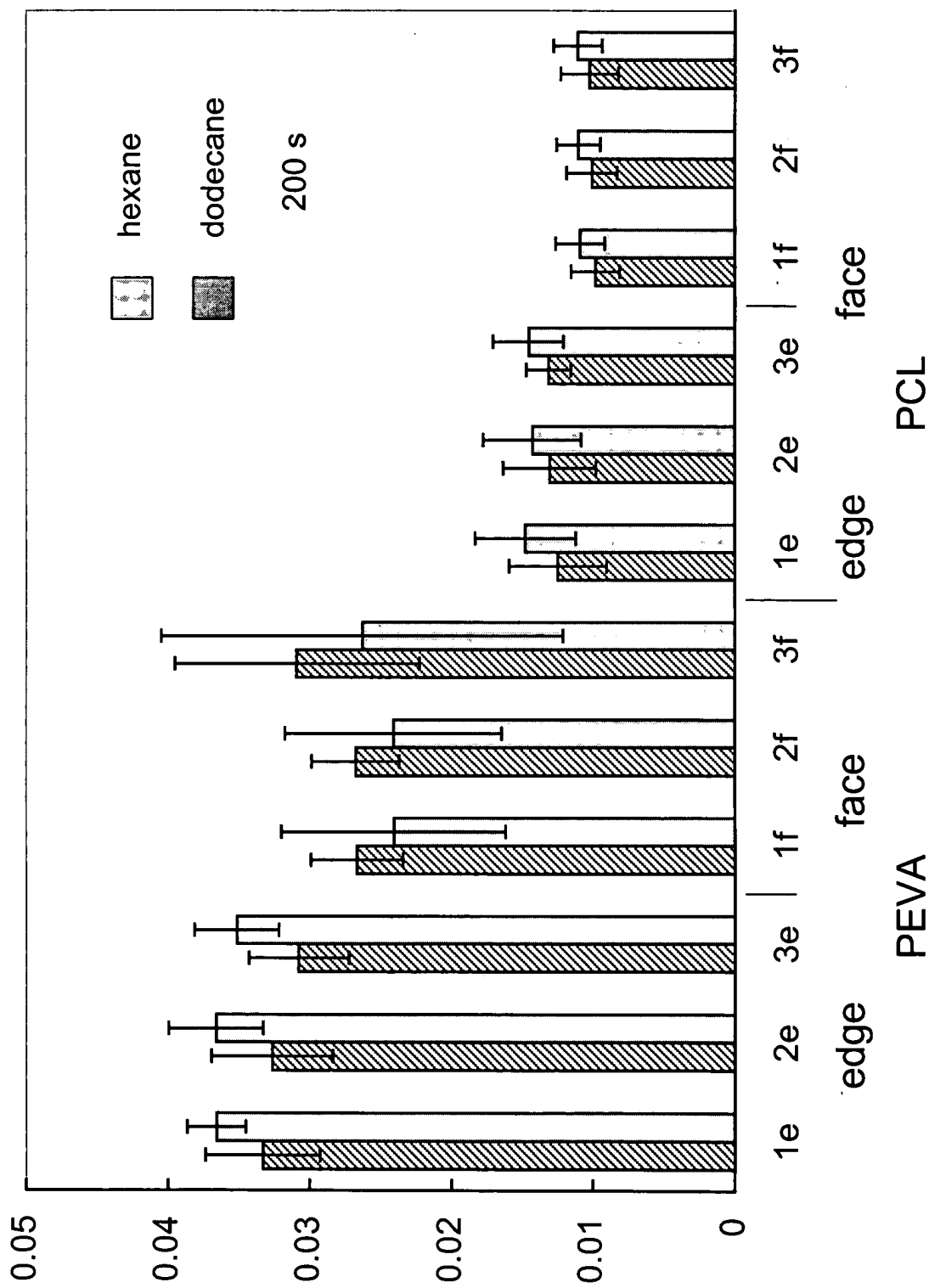


FIG. 14B

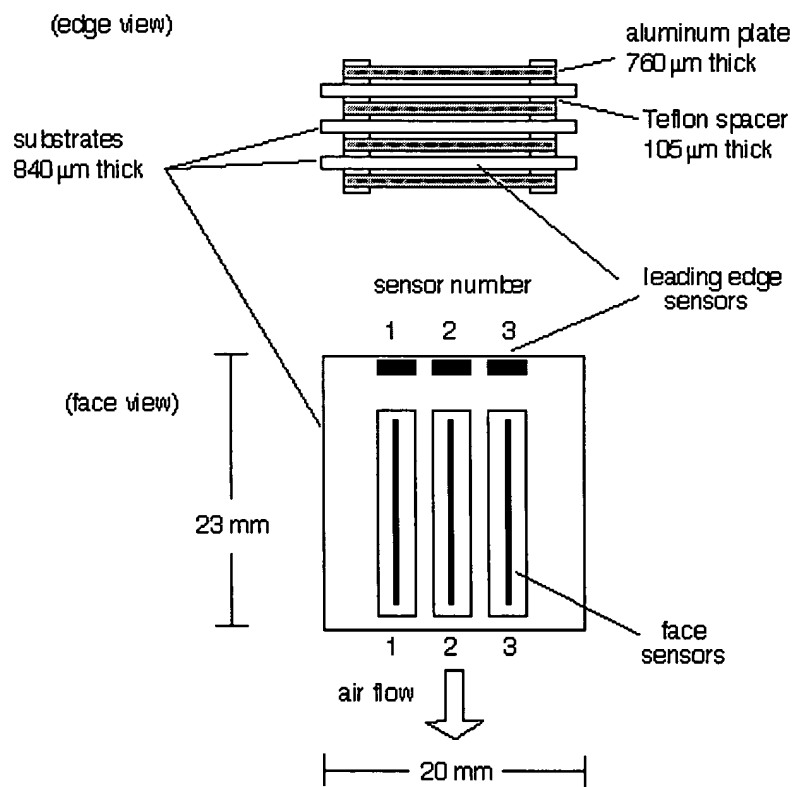


FIG. 15

Raw Responses to Pure DNT Vapor Dilutions and DNT Vapor Dilutions Containing High Concentrations of Contaminant Vapors

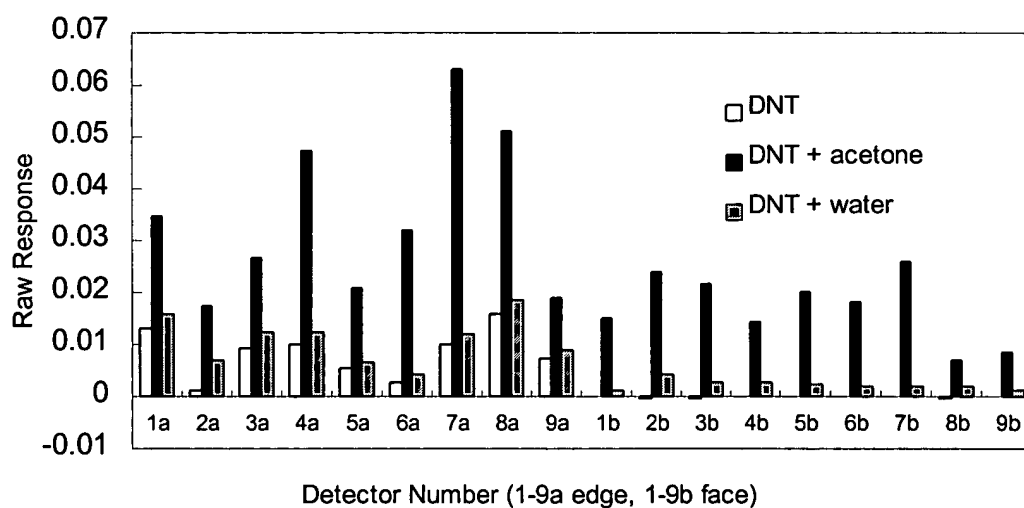


FIG. 16

